



Aging Power Plant Study

California Energy Commission
Integrated Energy Policy Report
Committee Workshop

Sacramento, California
March 24, 2004



Workshop topics

- Background
- Selection of plants to study
- Study methodology
- Data needs and sources
- Next steps





Integrated Energy Policy Report Process

- *Energy Report* required every two years
- Update required in off years
- *2003 Energy Report* identified three topics for 2004 Update:
 - *Aging power plants*
 - *Renewable resources*
 - *Transmission planning*



Preliminary Schedule for the 2004 Energy Report Update

March through June	Committee workshops on work in progress for the update topics
Late July	Publish draft reports
Late August	Workshops/ hearings
Mid-September	Publish draft final reports
Early October	Committee workshops/ hearings
Late October	Commission adoption hearing



Aging Power Plant Study Objectives

This study has three main objectives:

1. Analyze the role that aging power plants play in maintaining a reliable power system, including capacity resources and local reliability services,
2. Assess the environmental and natural gas implications of continued reliance on aging power plants, and
3. Examine the range of retirements that can be anticipated over the next few years and the implications of these potential retirements for system reliability, natural gas and the environment.



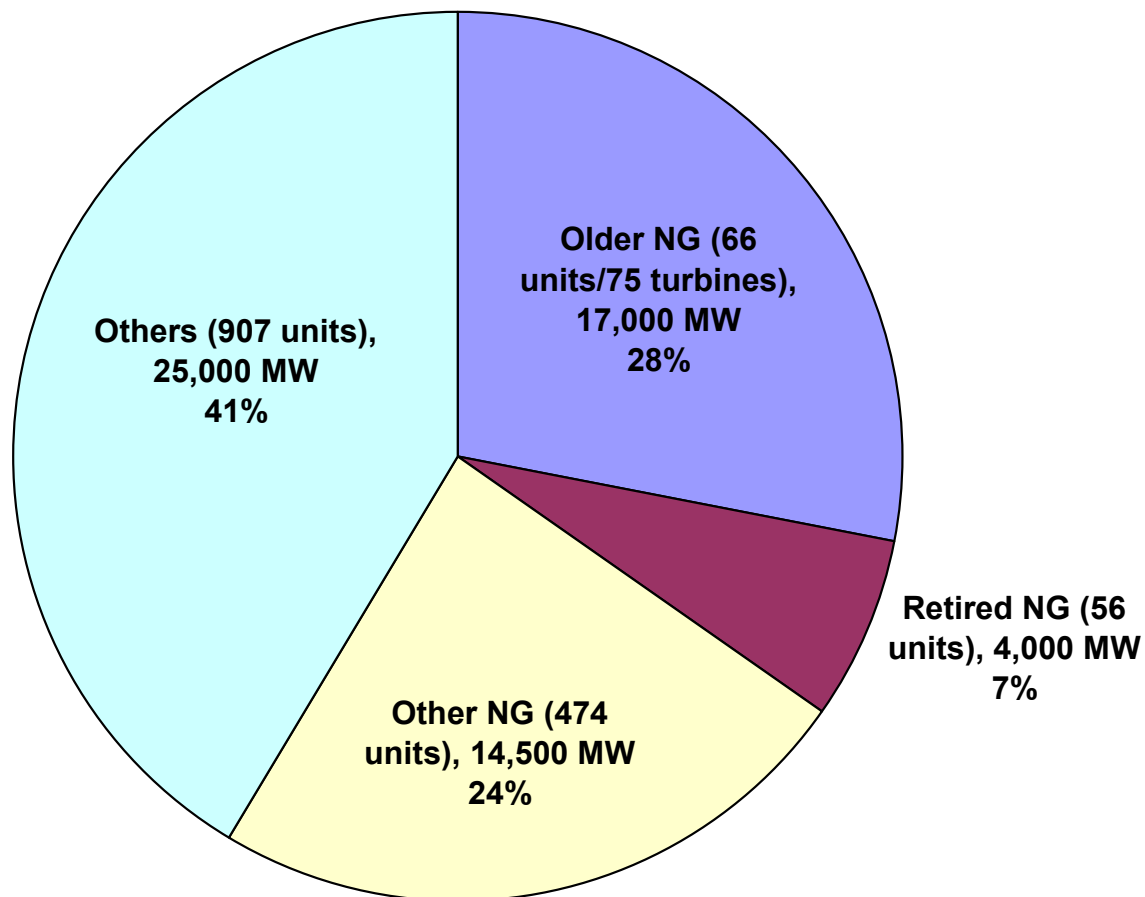
Main Workshop Purpose

Gather input from stakeholders on:

- proposed approach
- other issues to include in study
- stakeholder participation in study
- potential sources of information



Electric Generating Units in California

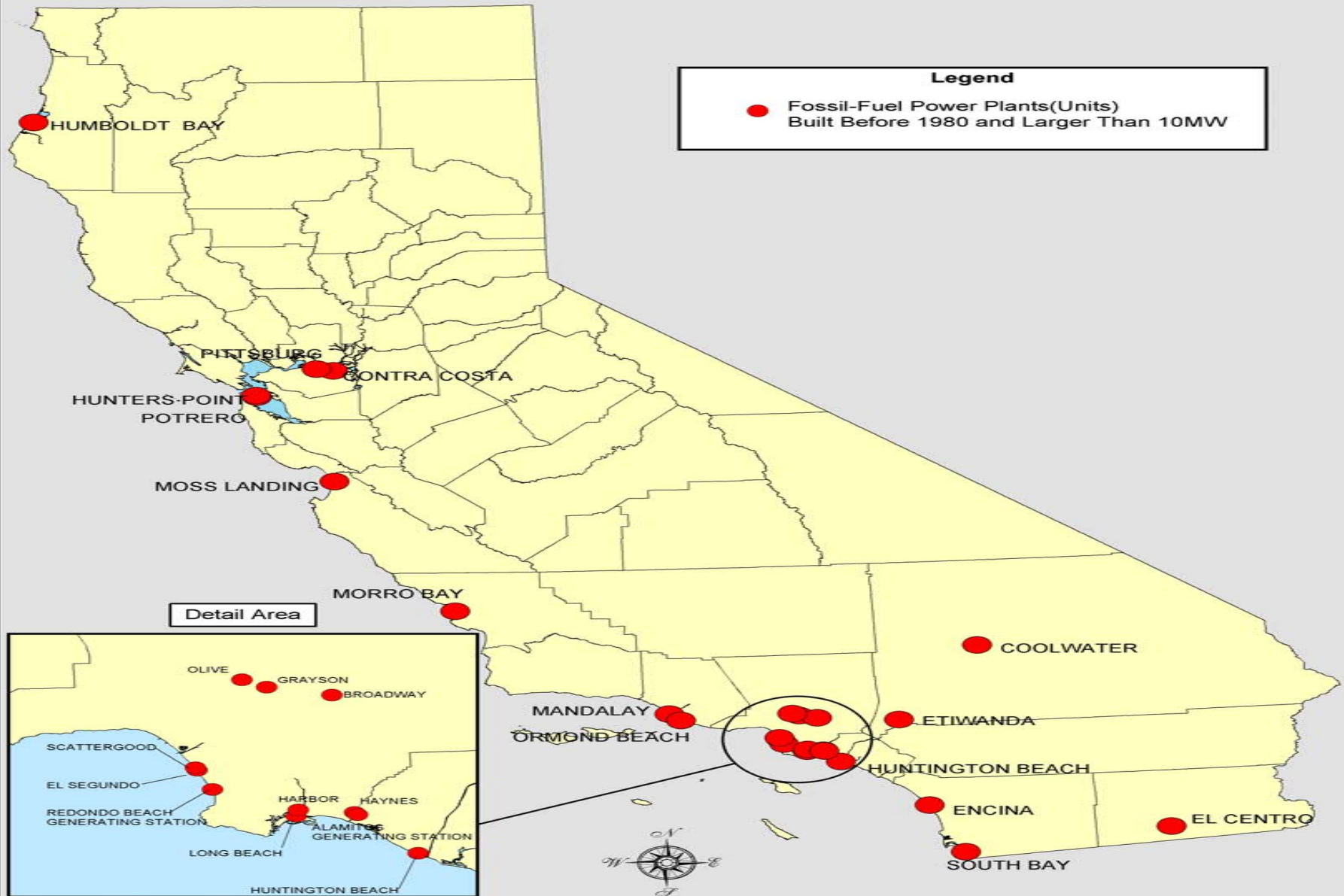




Unit Selection Criteria

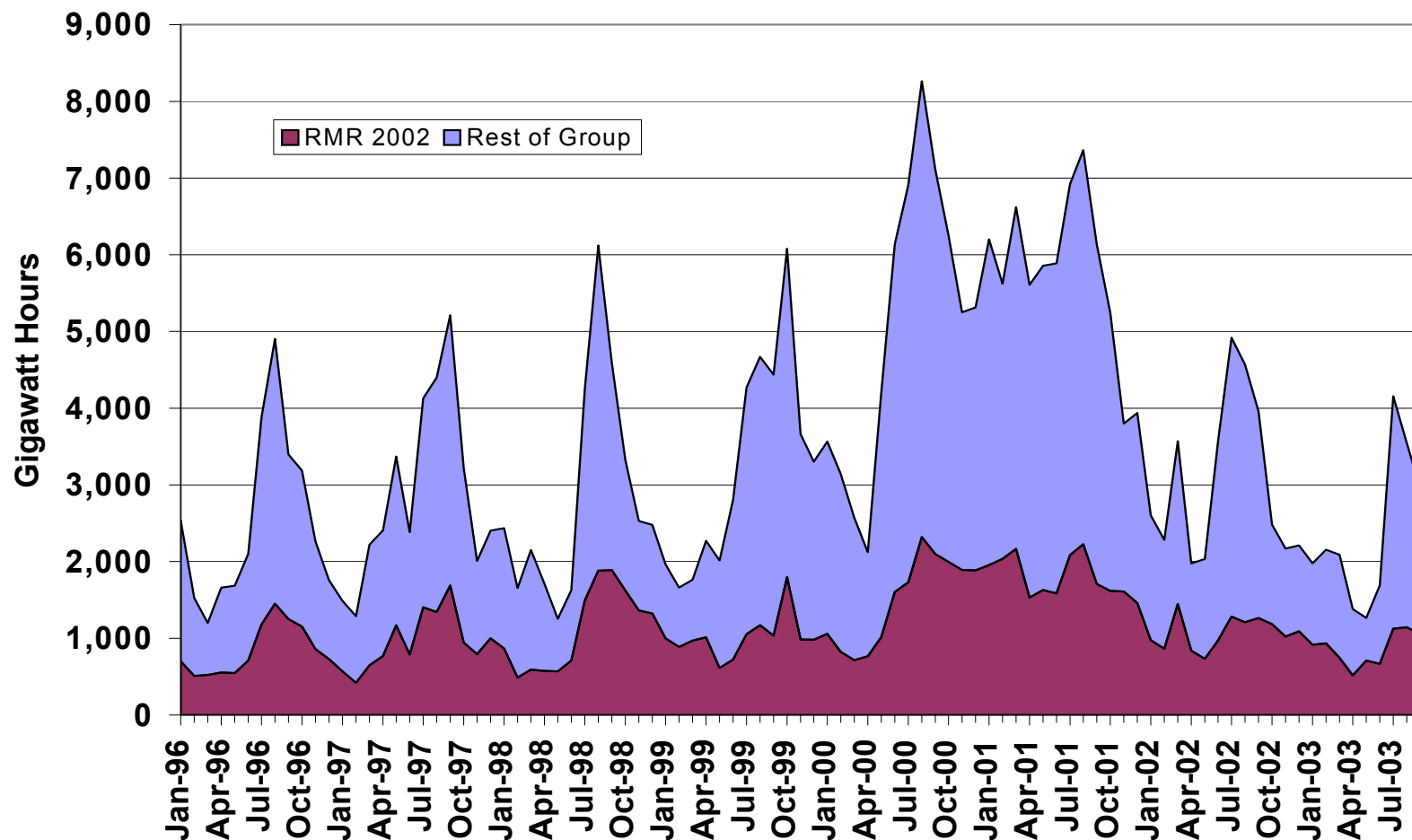
- Units selected:
 - Grid connected
 - Natural Gas-Fueled
 - Built before 1980
 - Larger than 10 MW
- Units not selected:
 - Peakers
 - Those scheduled to retire before 2005

Study Group for Aging Power Plant Study



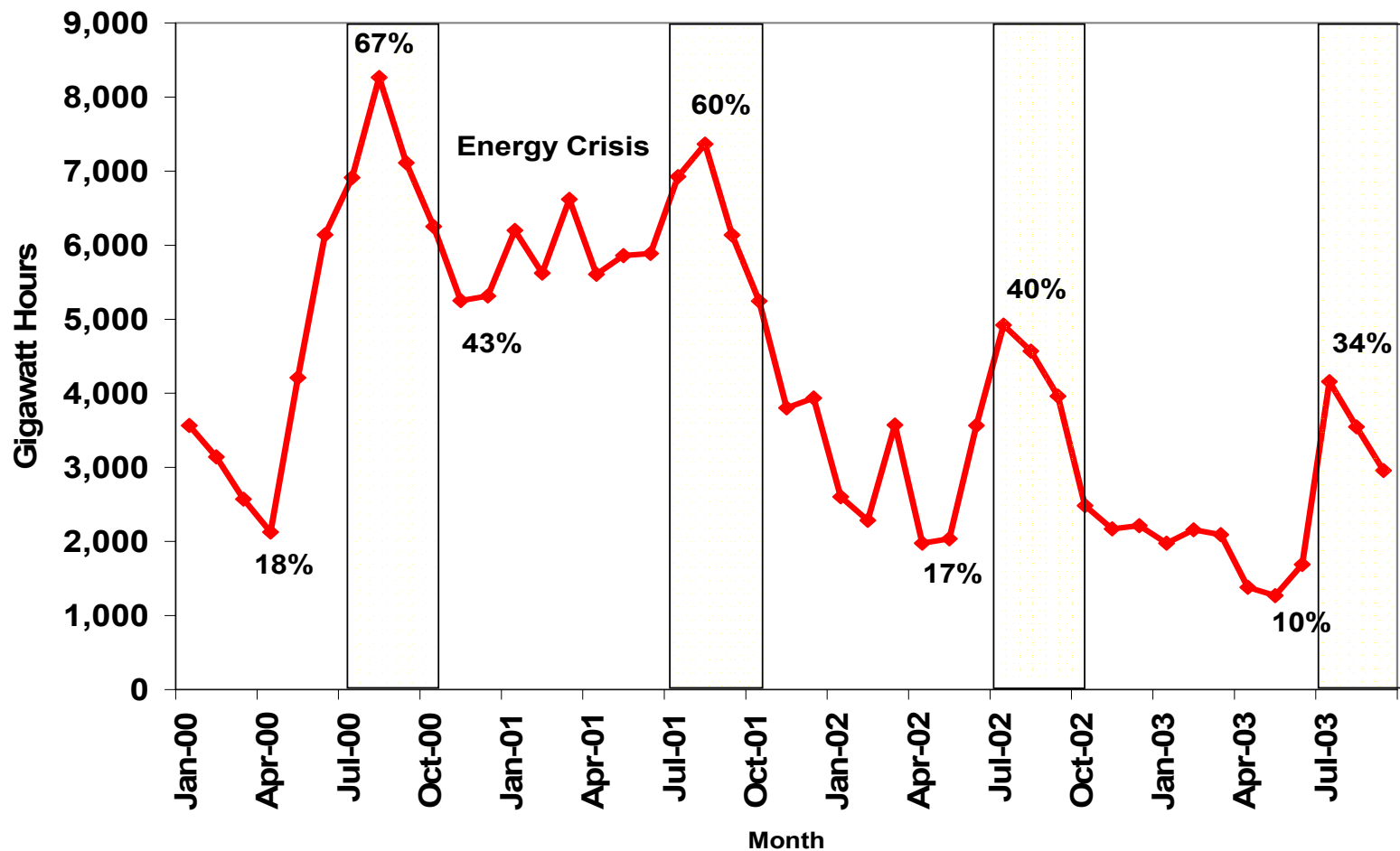


Monthly Output Trend



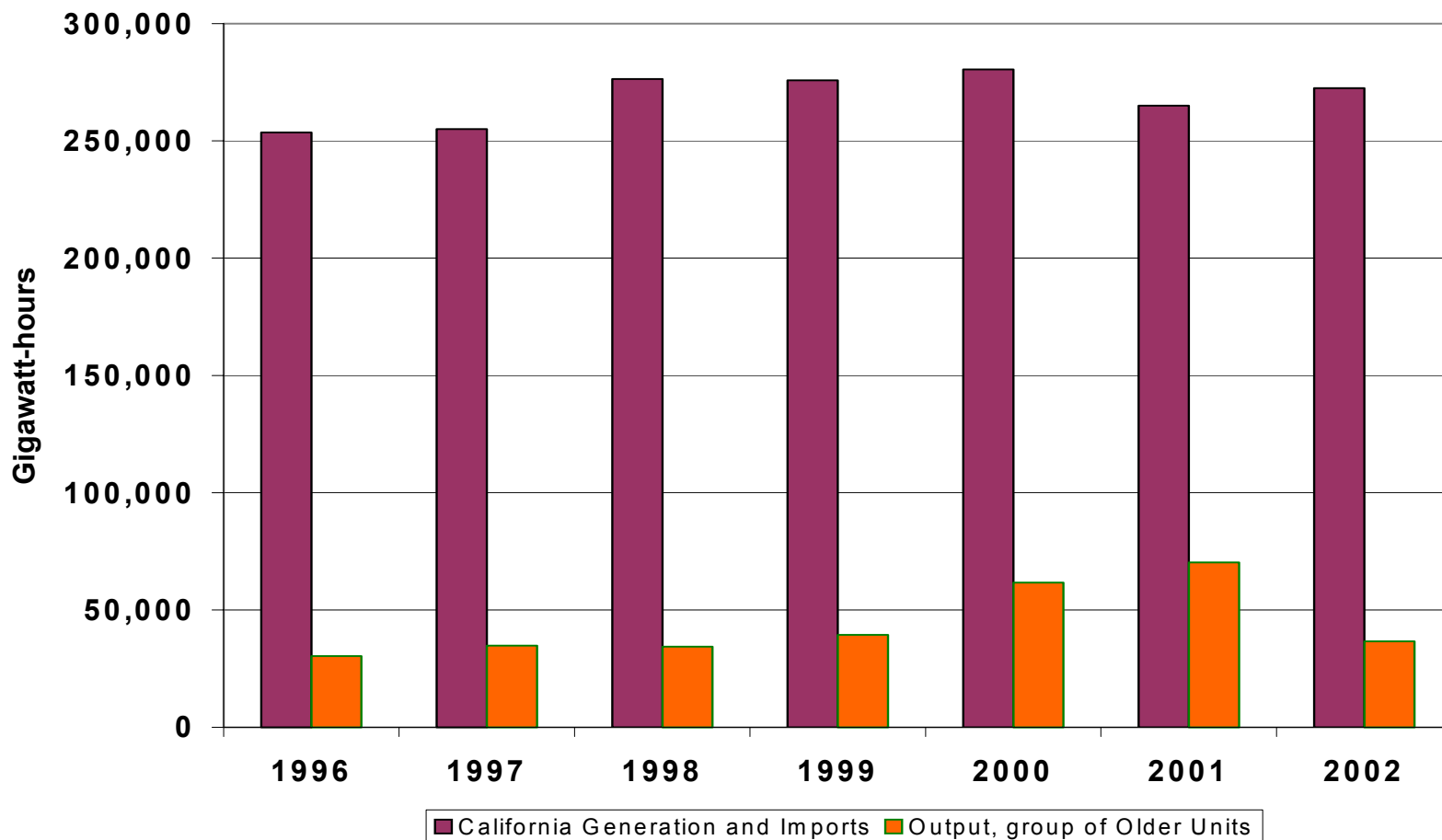


Monthly Output Trend





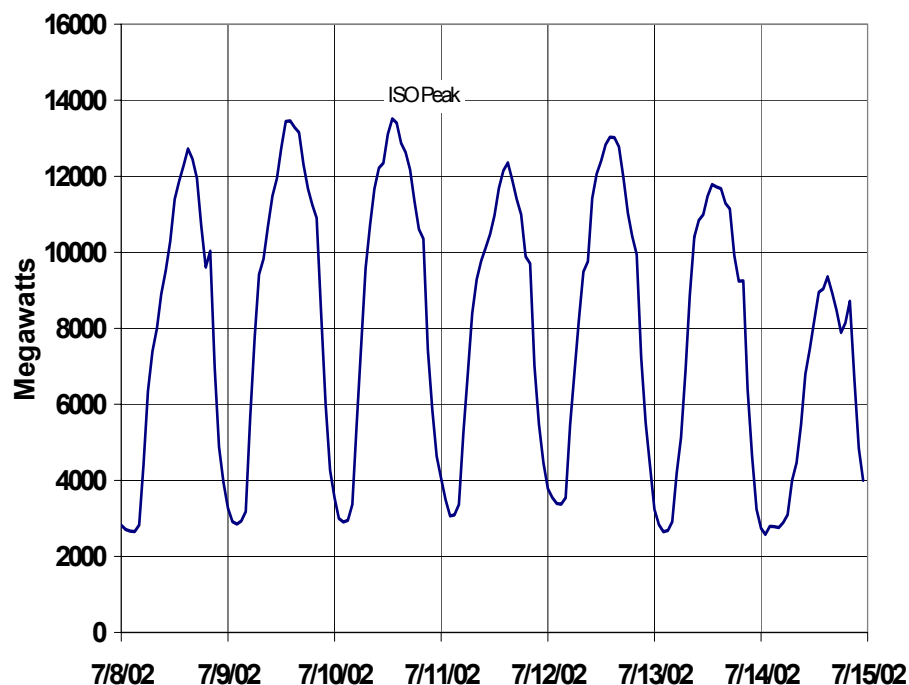
Production from Selected Units



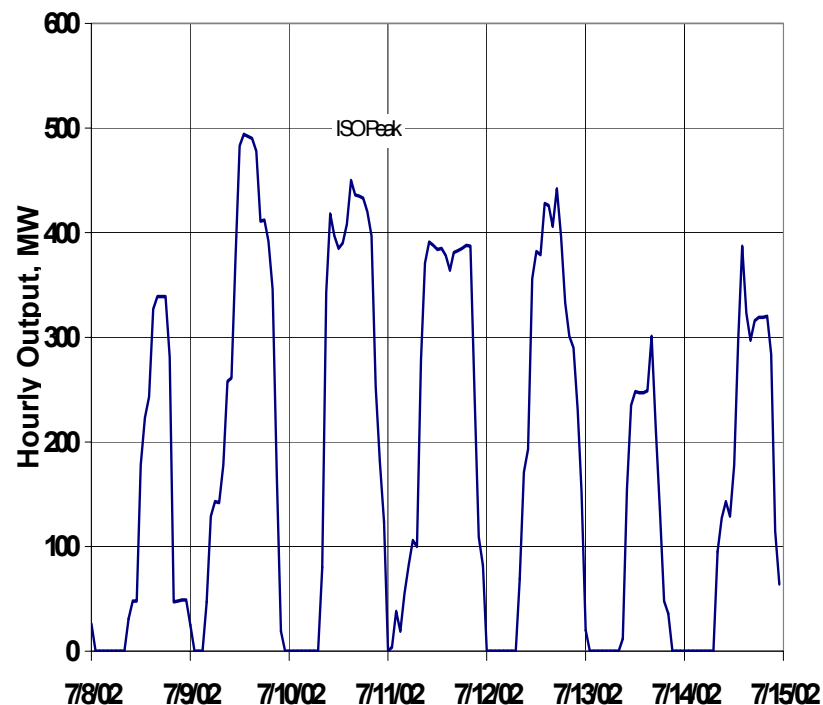


Hourly Output Compared to Peakers

Group of Older Units



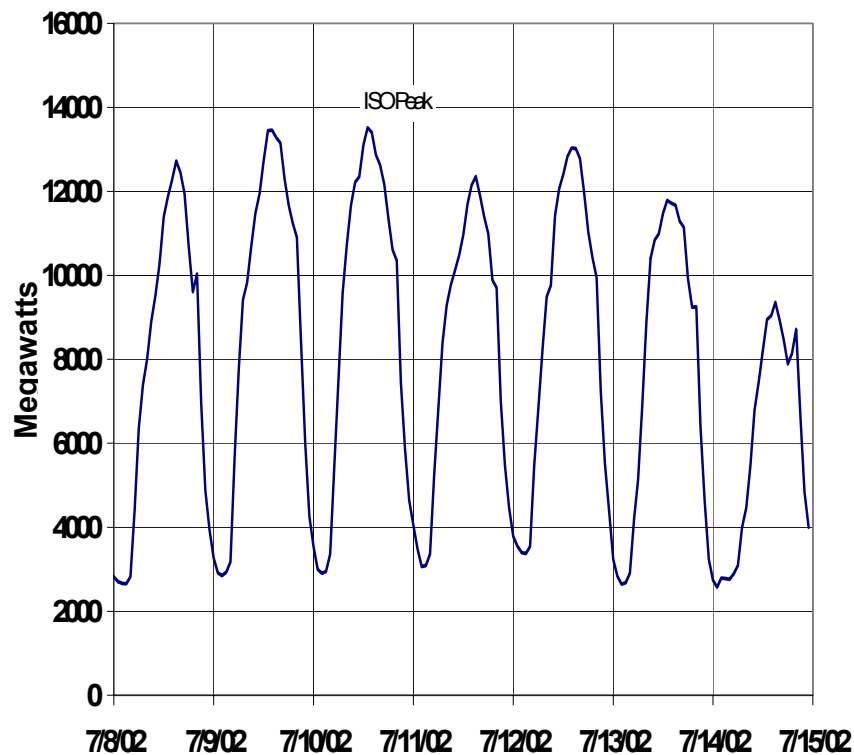
14 New Peakers



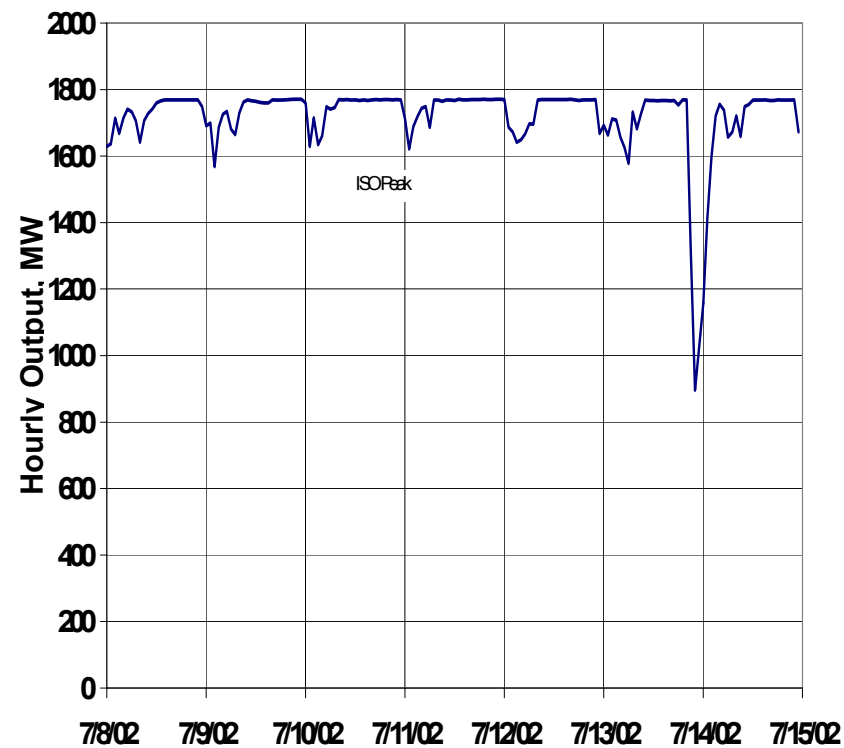


Output Compared to Baseload

Group of Older Units

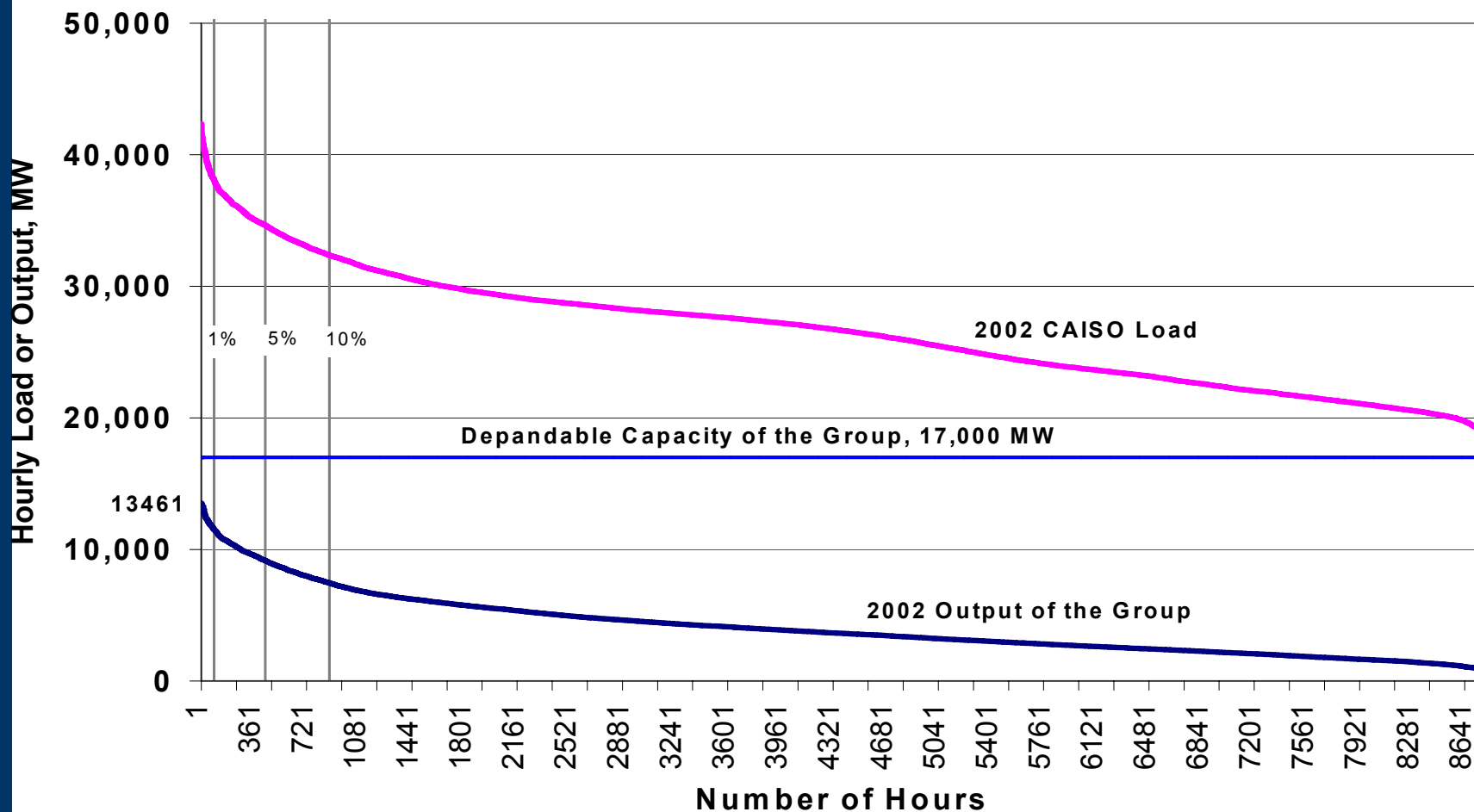


Intermountain Coal Plant



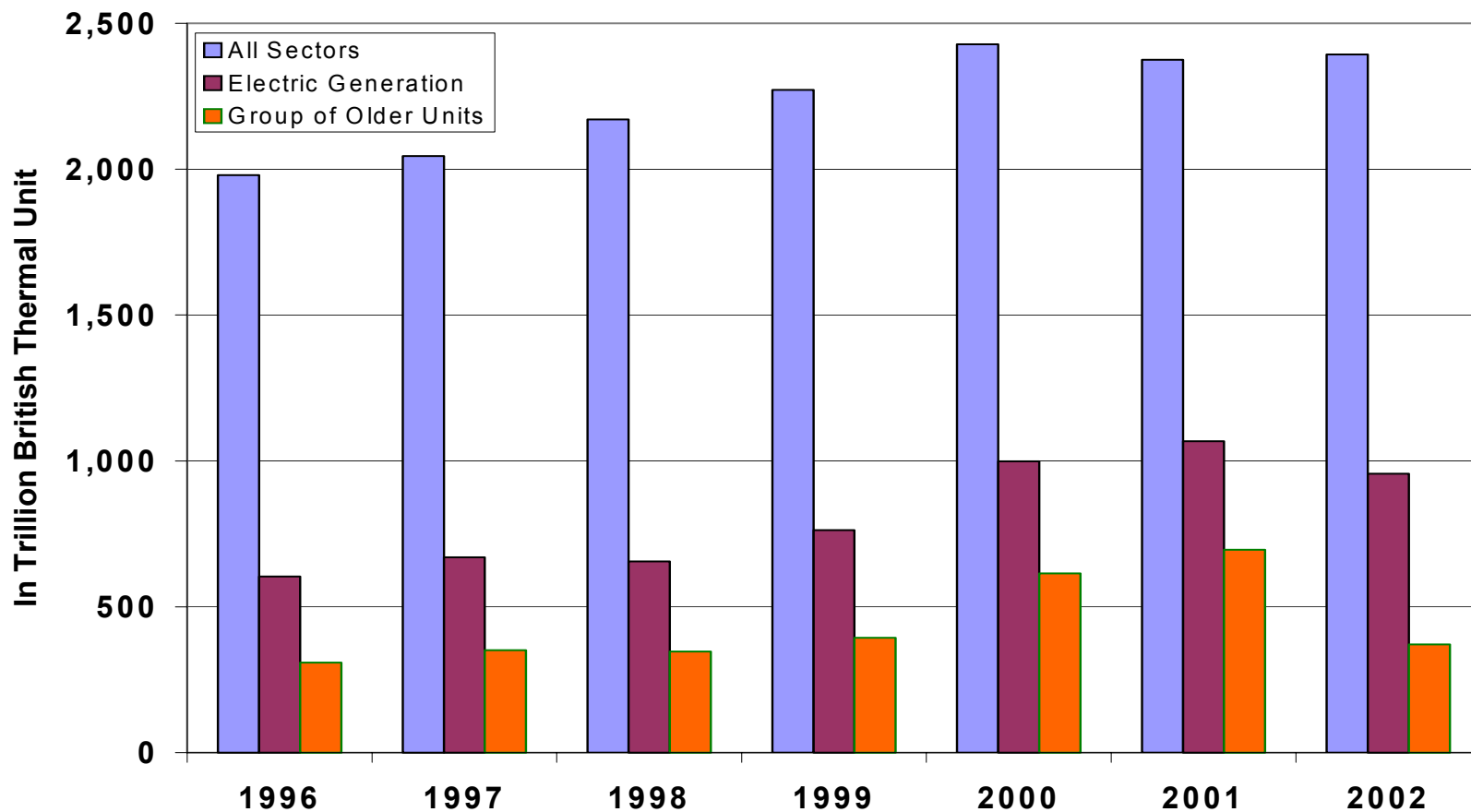


Load Duration Curve



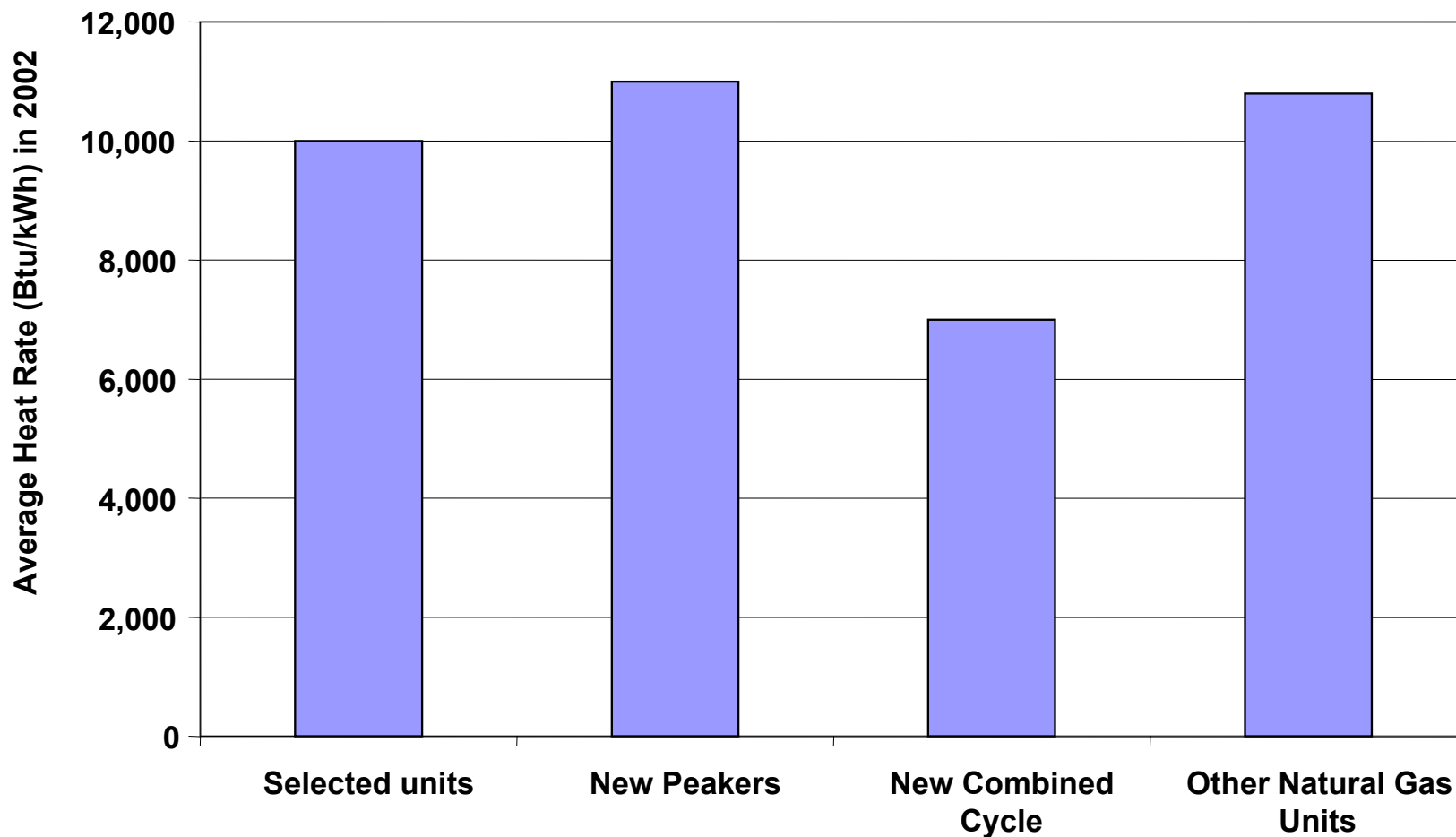


Natural Gas Consumption



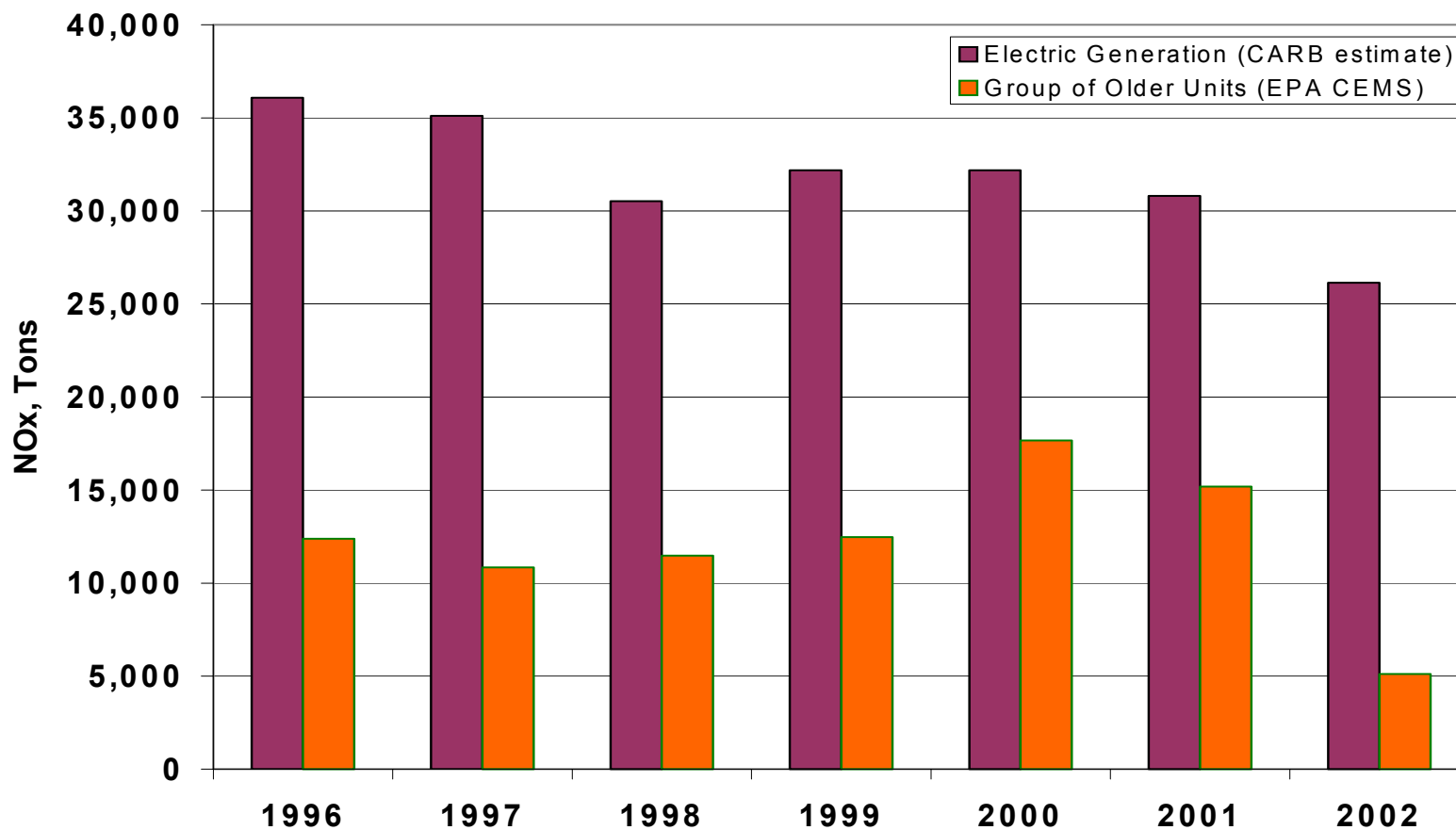


Efficiency Relative to Other Units



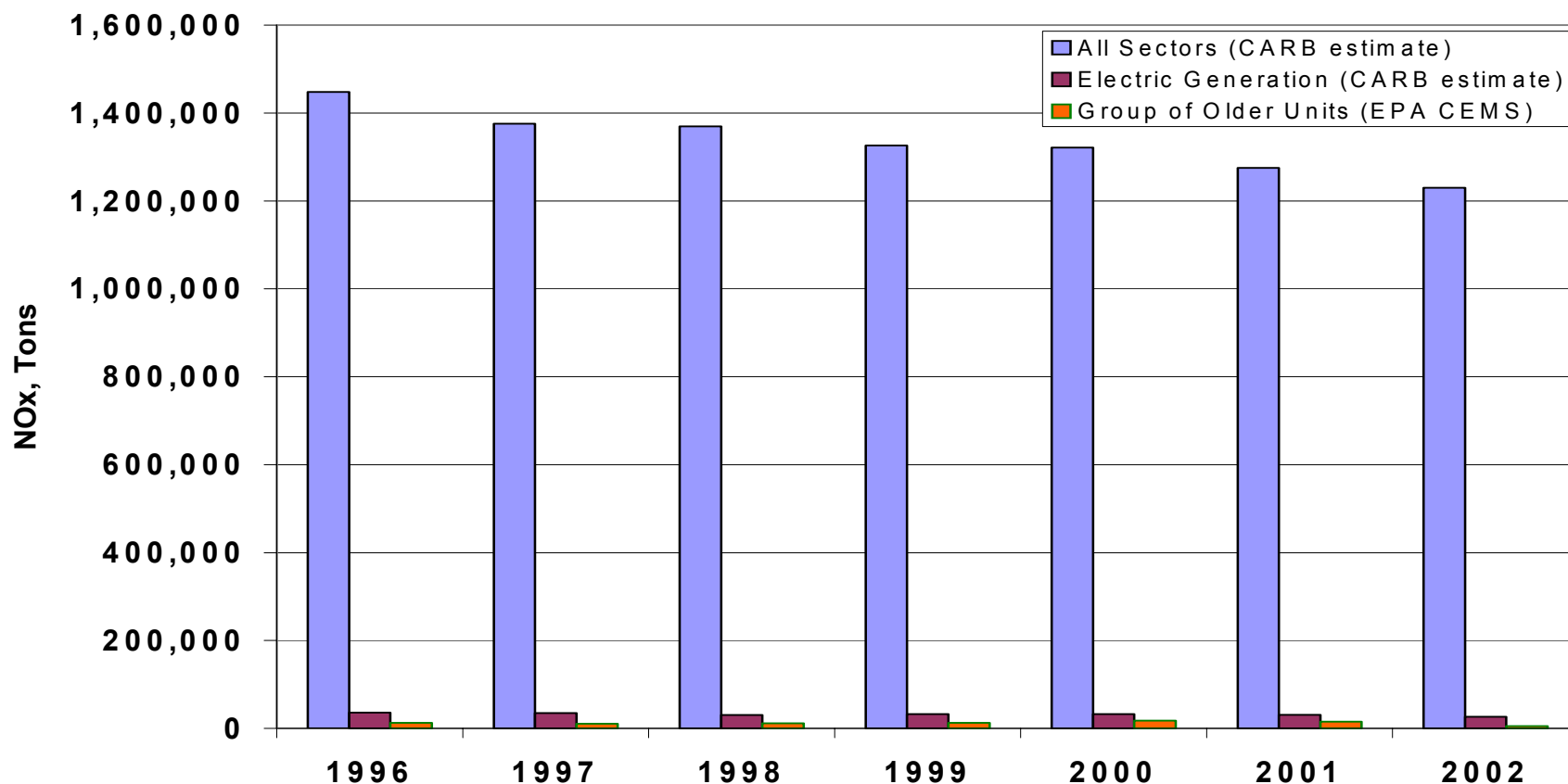


NO_x Emissions



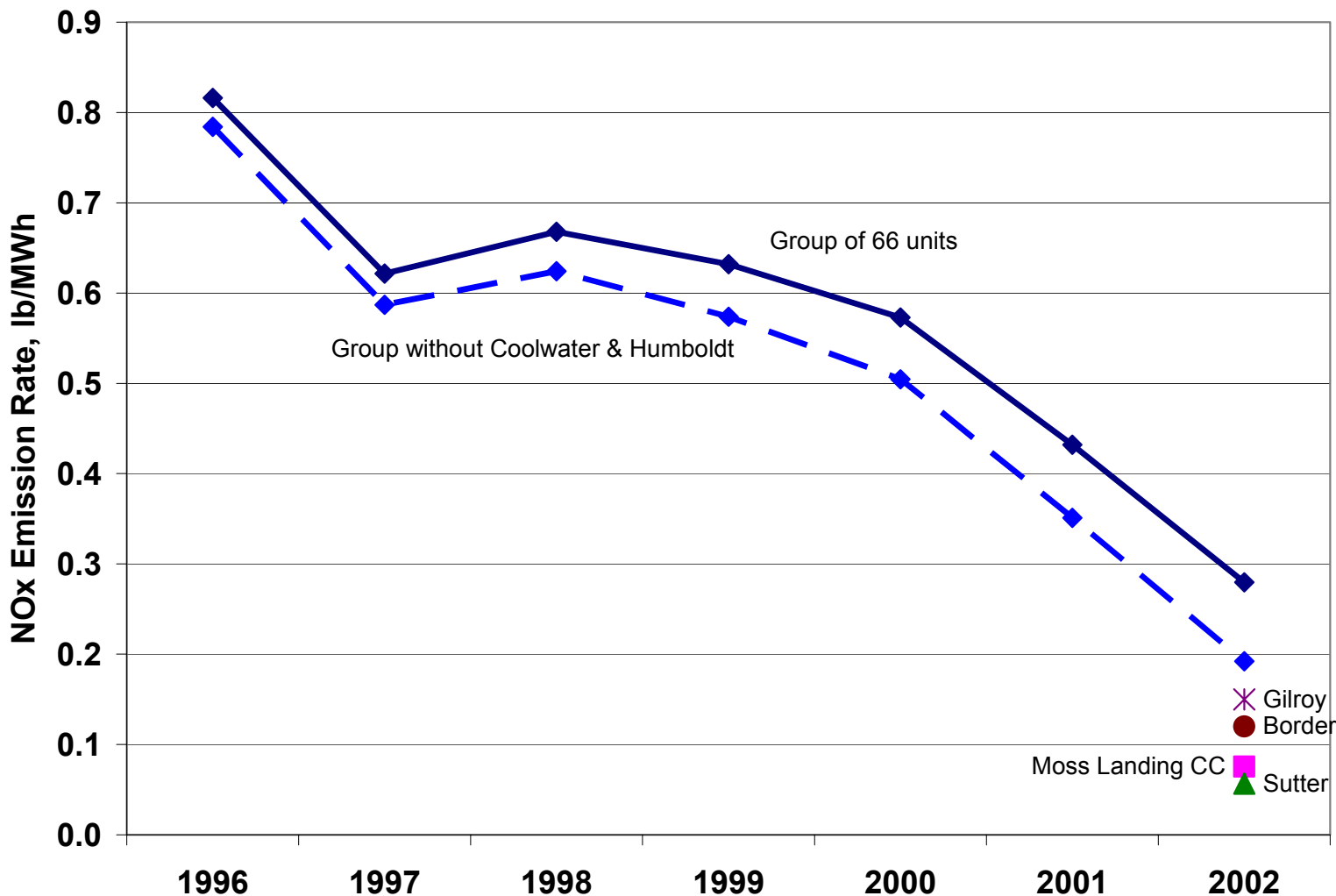


Emissions Compared to Total Inventory





Emissions Relative to Other Units





Questions

- What criteria should be considered for selecting power plants for the study?
- Should certain power plants be included or excluded from the initial selected group for study, and why?



Proposed Study Methodology

1. Provide Data on Study Group:
 - a. Operational History in 2001 and 2003
 - b. Contractual Information
 - c. Projects, Plans and Policies Affecting Economics
 - d. Breakdown/Failure Rates
2. Classify Generating Units Based on Retirement and/or Failure Risk, and Quantify Each Classification



Proposed Study Methodology

3. Conduct Supply/Demand Balance and Modeling on Effects of Retirements
 - a. Study Period: Present through 2008
 - b. Develop Scenarios Based on Range of Retirements
 - c. Identify Local Reliability Concerns



Proposed Study Methodology

4. Identify Possible Replacements and Estimate Costs
 - a. New or Repowered Plants
 - b. Transmission Projects/Upgrades
 - c. Renewable Energy Projects
 - d. Distributed Generation
 - e. Demand-Side Management



Proposed Study Methodology

5. Quantify Effects on Natural Gas System from Retirements, and Operation
 - a. Provide Data on Historic Gas Use
 - b. Conduct Gas Modeling Assuming Range of Operation (Agg. Capacity Factor) and Retirements
6. Identify and Quantify Environmental Effects



California Generation and Air Emissions

Relatively Low-Emission Generation System,
Relying on:

- a diverse resource mix
- a predominance of natural gas for the fired units
- broad use of emission controls

System Emission Factors Should Continue
Improving Because:

- of implementation of existing retrofit rules
- new resource additions are cleaner and more efficient than system averages



Aging Generation and Air Regulations

District Retrofit Rules Negotiated and In Place Prior to Divestiture

- staggered implementation between 1995 to 2005
- relying on retrofits and/or operational limits
- achieving significant NO_x reductions

CPUC EIR on Divestiture Concluded that:

- existing rules adequate
- units must comply with existing rules



Air Emissions - Proposed Study Approach

As Existing Retrofit Rules are Implemented:

- can they be coordinated with other plant outages and retirements?

If New Retrofit Rules are Adopted:

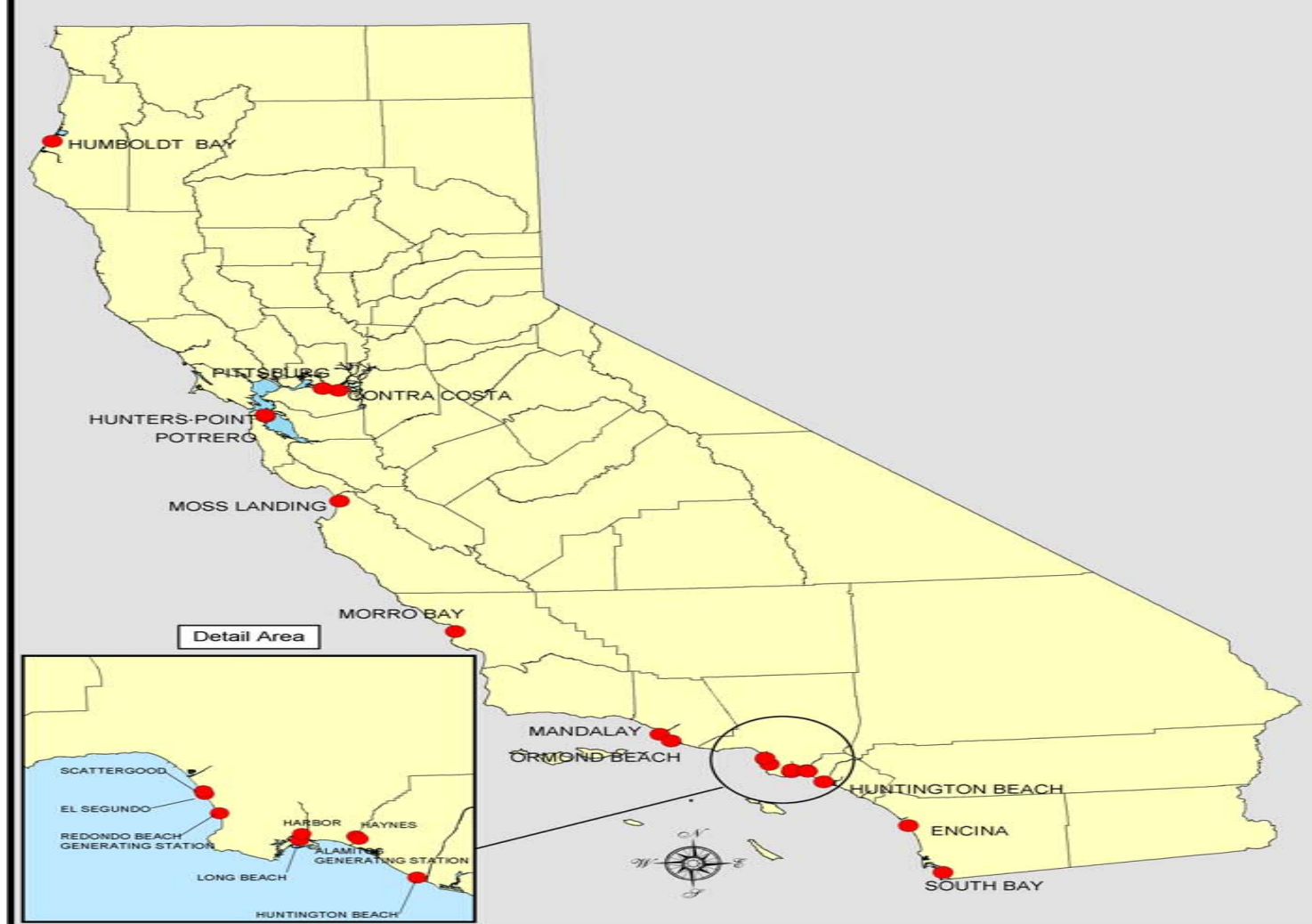
- will they be the most cost effective reductions available?
- can they be coordinated with other plant outages and retirements?
- do they increase our reliance on natural gas?

New/Replacement Power Plants:

- when and where?
- will offsets/mitigation be available or required?



Aging Power Plant Study Once Through Cooling Facilities





Regulatory Requirements for Once-Through Cooling

- NPDES Permit
 - 316a permit for Thermal Discharge
 - 316b permit for Impingement and Entrainment
- Consistency Determinations
 - w/California Coastal Act by California Coastal Commission
 - w/Porter-Cologne Water Quality Control Act by State Water Board



Once-Through Cooling Proposed Study Approach

- Permit renewal schedules and requirements
- Impingement and entrainment studies
- Project specific impacts
- Cumulative impacts
- Cost/benefits to upgrading to modern designs





Land Use Factors – Proposed Study Approach

- Site reuse plans developed by community encompassing aging power plant facilities
- Development pressures and community priorities in highly desirable land use areas
- Surrounding land use compatibility



Environmental Questions

- Are air emissions, once through cooling and land use the appropriate environmental factors for this study?
- Are the environmental study approaches reasonable and appropriate for an examination of aging power plants?



Methodology Questions

- What methodology should the staff employ to assess the role these plants play in the state's power market accurately?
- What policies, plans, and practices are in place that might cause the retirement of these plants?
- What policies, plans, and practices are in place that might cause these plants to remain in operation?



Data and Information Collection

- Historical Operating Data (2001 and 2003)
- Dispatch Criteria/Bidding Process
- Relevant Contract Provisions Affecting Economics or Dispatch (DWR, RMR, etc.)
- Identify Projects, Plans and Policies Affecting Retirement Decisions for Aging Plants
- Identify Projects, Plans and Policies Affecting Continued Operation of Aging Plants



Data/Informational Needs Question

- What information should be considered, and what data should the staff collect, in conducting the Aging Power Plant Study?



General Questions

- Have we captured the issues associated with aging plants that this study should focus on?
- What should be the next steps in terms of developing a collaborative process for this project?